

renville. (Umbach).” A specimen so named, from Warrenville, is *A. laevis* L.

LACTUCA FLORIDANA (L.) Gaertn. “Low rich thickets, occasional. Common southeast. Beach near Waukegan. (Umbach).” There is no sheet so named and labelled Waukegan; one from Beach, Ill. (a station near Waukegan, apparently the location in question) is *L. ludoviciana* (Walt.) Riddell. Specimens labelled *L. floridana*, from Naperville, Sag, and Riverside, Ill., are all *L. villosa* Jacq.

MADISON, WISCONSIN.

RECENT DISCOVERIES IN THE NEWFOUNDLAND FLORA

M. L. FERNALD

(Continued from page 185)

NARDUS STRICTA L. The Newfoundland record has rested upon *Robinson & Schrenk*, no. 209, from rocky banks of Rennie’s River, St. John’s. Mrs. Ayre now sends material from the Newtown Marsh near St. John’s, as also from Quidi Vidi and banks of Waterford River—all in the same general area; also from the marshes of Beaver Pond, Salmonier.

*AVENA FATUA L. Apparently becoming a rather general weed in Newfoundland, as elsewhere in eastern America. Mrs. Ayre gets it in old fields and waste places on the Avalon Peninsula. Our collection from the West Coast is from BONNE BAY: bushy margin of cultivated clearing, Middle Brook, *Fernald, Long & Fogg*, no. 1287.

SPHENOPHOLIS PALLENS (Spreng.) Scribn. The northernmost station yet known in on BONNE BAY: limestone cliffs and talus, Tucker’s Head, *Fernald, Long & Fogg*, no. 1295.

DESCHAMPSIA ATROPURPUREA (Wahlenb.) Scheele. Additional station on the HIGHLANDS OF ST. JOHN: peat on quartzite slopes, head of Deep Gulch, Doctor Hill, *Fernald, Long & Fogg*, no. 1297.

*AGROSTIS ROSSAE Vasey. BONNE BAY: rocky soil, August 1, 1930, *K. P. Jansson*.

This is the first station in eastern America for a characteristic little species (with very short-tufted leaves and dense linear-cylindric panicles, with spikelets about 2 mm. long) of the cordilleran region from Wyoming and Colorado to British Columbia and California. Its discovery at Bonne Bay is a clear indication of the need of further work there. Our party of 1929 did not see it; neither did Mr. Jansson find many of the localized species seen by us. He made his center at Lomond and in his brief stay reached areas we did not visit.

THE VARIATIONS OF AGROSTIS BOREALIS.—The species generally known as *Agrostis borealis* Hartm. presents in eastern North America

three strikingly different variations, which by some botanists have been considered distinct species, by others as of not even formal value. In Newfoundland all three occur and in their best development they are so distinct that they have been heretofore regarded by me as three species; but with the accumulation of much material it becomes apparent that their characters are intergradient and that they have no fundamental morphological distinctions. As geographic varieties, however, they are tolerably definite; and their distinguishing characters are enumerated below.

- a.* Lemma awned: branches of mature panicle spreading-ascending.
 Spikelets (glumes) 2-3 (av. 2.6) mm. long: culms 0.4-4.5 dm. high: leaf-blades 0.2-2 mm. broad, flat or more commonly involute: panicle 1.5-14 cm. long. Var. *typica*.
 Spikelets (glumes) 2.8-4 (av. 3.3) mm. long: culms 1.5-7.5 dm. high: leaf-blades 1-4 mm. broad, flat: panicle 3-17 cm. long. Var. *americana*.
a. Lemma awnless: branches of mature panicle strongly ascending: spikelets 2.8-4.6 (av. 3.6) mm. long: culms 0.2-3.5 dm. high: leaf-blades 0.2-2 mm. broad, flat or involute: panicle 1-10 cm. long. Var. *paludosa*.

A. BOREALIS Hartm., var. **typica**. *A. borealis* Hartm. Skand. Fl. ed. 3: 17 (1838); Hitchcock, N. Am. Sp. Agrostis—U. S. Dept. Agric. Bur. Pl. Ind. Bull. no. 68: 52 (1905), in large part (1905). *A. Mertensii* Trin. Mém. Acad. St. Pétersb. sér. 6, vi² 331 (1841). *A. canina*, var. *alpina* Oakes, Cat. Pl. Vermont, 32 (1842). *A. canina*, var. ? *tenella* Torr. Fl. N. Y. ii. 443 (1843). *A. concinna* Tuckerm. Hovey's Mag. Hort. ix. 143 (1843) and Am. Journ. Sci. xlv. 42 (1843). *A. Pickeringii*, β . *rupicola* Tuckerman, Am. Journ. Sci. l. c. (1843). *Trichodium concinnum* (Tuckerm.) Wood, Cl.-Bk. ed. 2: 600 (1847).—Northern Eurasia; northern North America from Greenland and Labrador to the higher mountains of Maine, New Hampshire, northern Vermont and northern New York; Alaska and British Columbia. The following, selected from a large representation, are typical. LABRADOR: Nachvak, *Sornborger*, no. 244; Hopedale, *Sornborger*, no. 225; Anatolak, *Sewall*, nos. 425, 440, 442, 444; Nain, *Sewall*, no. 92, *Bishop*, no. 59. NEWFOUNDLAND: Little Quirpon, *Fernald & Long*, no. 27,474; summit, Bard Harbor Hill, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, no. 27,473; Deer Pond Brook, Highlands of St. John, *Fernald & Long*, no. 27,475; dry meadow on tableland of Doctor Hill, *Fernald, Long & Fogg*, no. 1309; serpentine tableland, Bonne Bay, *Fernald & Wiegand*, no. 2526, *Fernald, Long & Fogg*, no. 1312; limestone cliffs near Stanleyville, *Fernald, Long & Fogg*, no. 1311; Lark Mountain, *Fernald, Long & Fogg*, no. 86; Blow-me-down Mts., *Eames & Godfrey*, nos. 5829, 5831; Harry's River, *Fernald & Wiegand*, no. 2524. QUEBEC: Blanc Sablon ("Labrador"), *Fernald & Wiegand*, no. 2522; Tabletop Mts., *Fernald & Collins*, no. 389; Mt. Dunraven,

Tabletop Mts., *Fernald, Dodge & Smith*, no. 25,483; Coulée des Fourches, Mt. Albert, *Victorin, Rolland, Brunel & Rousseau*, no. 17,814; Little Cascapedia River, *Collins, Fernald & Pease*, no. 4931; Le Bicquet, Co. Rimouski, *Rousseau*, no. 30,039. MAINE: Mt. Katahdin, *A. Young et al.*; Mt. Bigelow, *Fernald & Strong*, no. 487. NEW HAMPSHIRE: White Mts., "In alpibus," as *A. concinna*, *Tuckerman* (TYPE or duplicate type of *A. concinna*); alpine region, White Mts., *Oakes*, as *A. canina*, var. *alpina* *Oakes*; and many subsequent collections from the mountains of Coös and Grafton Cos., including the following somewhat widely distributed numbered ones: Mt. Washington, *Robinson*, no. 981; *Hitchcock*, Amer. Gr. Nat. Herb. no. 443; Mt. Lafayette, *Fernald* in Pl. Exsicc. Gray. no. 117. VERMONT: Mt. Mansfield, *Pringle, Faxon et al.* NEW YORK: Whiteface Mt., *Hitchcock*, Amer. Gr. Nat. Herb. no. 442; Mt. McIntyre, *House*, no. 9493. ALASKA: Nome, *Hitchcock* in Amer. Gr. Nat. Herb. no. 348 (no. 347 of the same series, as represented in the Gray Herbarium is not *A. borealis*). BRITISH COLUMBIA: small peak above timber line, Selkirk Mts., *Shaw*, no. 1019, as *A. varians*.

Forma **macrantha** (*Eames*), n. comb. Var. *macrantha* *Eames*, RHODORA, xi. 88 (1909).—Spikelets proliferating or "viviparous." Perhaps pathogenic. NEWFOUNDLAND: Blow-me-down Mts., *Eames & Godfrey*, no. 5833 (TYPE collection); Lark Mountain, *Fernald, Long & Fogg*, no. 87. QUEBEC: Rivière Mingan, *Victorin & Rolland*, no. 24,754. NEW HAMPSHIRE: Alpine Garden, Mt. Washington, *Pease*, no. 1742.

*Var. **americana** (*Scribn.*), n. comb. *A. Pickeringii* *Tuckerm.* *Hovey's Mag. Hort.* ix. 143 (April, 1843), *Am. Journ. Sci.* xlv. 42 (April–June, 1843), excl. β . *rupicola*. *A. rupestris* *Chapm. Fl. So. U. S.* 551 (1860), not All. *A. novae-angliae* *Vasey, Contr. U. S. Nat. Herb.* iii. 76 (1892), in part (excl. synonym), not *Tuckerm.* *A. rubra*, var. *americana* *Scribn. Grasses of Tenn.* pt. ii. 77, t. xxv. fig. 100 (1894).—Western Newfoundland and eastern Quebec to mountains of Maine and New Hampshire; Roan Mt., North Carolina and Tennessee. The following are characteristic. NEWFOUNDLAND: Overfall of Deer Pond Brook, Highlands of St. John, *Wiegand, Gilbert & Hotchkiss*, no. 27,476, no. 27,477 (with habit of var. *paludosa*); Southwest Gulch, Bard Harbor Hill, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, no. 27,478; Yellow Brook, Doctor Hill, *Fernald, Long & Fogg*, no. 1313. QUEBEC: Blanc Sablon ("Labrador"), *Fernald & Wiegand*, no. 2523; Lac du Vieillard, Gaspé Co., *Fernald, Dodge & Smith*, no. 25,484; River Ste. Anne des Monts, *Fernald & Collins*, no. 414; Cap Chat River, *Fernald & Pease*, no. 24,856; Mt. Fortin, *Fernald & Pease*, no. 24,857; Grand Cascapedia River, July 12–15, 1905, *Williams, Collins & Fernald*. MAINE: on Saddle Slide, in Great Basin and by Chimney Pond, Mt. Katahdin, July 10–13, 1900, *Fernald*. NEW HAMPSHIRE: White Mts., *E. Tuckerman* (TYPE or duplicate type of *A. Pickeringii* *Tuckerm.*; "in monte Great Hay-

stack," *Tuckerman*; margins of alpine brooks, White Mts., September 1, 1877, *Pringle* (TYPE collection of *A. novae-angliae* Vasey, acc. to Hitchcock, U. S. Dept. Agric. Bur. Pl. Ind. Bull. no. 68: 53); Lake of Clouds, Mt. Washington, *Faxon, Fuller, Williams et al.*; Oakes Gulf, Mt. Washington, *Faxon*; Tuckerman's Ravine, Mt. Washington, *Faxon et al.*; Cape Horn, Mt. Washington, *Faxon, Churchill*; Great Gulf, Mt. Washington, *Faxon*; Boott's Spur, Mt. Washington, *Williams*; Mt. Monroe, September 8, 1862, *Wm. Boott*; Mt. Lafayette, July 29, 1863, *Wm. Boott*; Eagle Cliff, Franconia, *Fernald & Smiley*, no. 11,533. NORTH CAROLINA: "In monte Roan dicto," July, 1841, *Gray & Carey*, labeled and reported (*Am. Journ. Sci.* xlii. 42 (1842)) without description as *A. rupestris*; Roan Mt. July, 1889, *Scribner* (TYPE collection of *A. rubra*, var. *americana*).

Agrostis canina, var. ? *tenella* was described by Torrey from "Mountains in the northern part of the State [of New York]," with "leaves linear, flat . . . a little more than a line wide." It might have been var. *americana*, but the description is quite as satisfactory for a well grown var. *typica*. The latter is the only form seen from the Adirondacks and Dr. E. D. Merrill informs me that Torrey apparently preserved no specimen to stand for his *A. canina*, var. ? *tenella*. I am, therefore, leaving it with typical *A. borealis*.

Agrostis rubra, var. *americana* was clearly published by Scribner in his *Grasses of Tennessee* (1894), with a good description, clear illustration and the citation of *A. rupestris* Chapm., not All., as a synonym. It was known to Scribner only from "Near the summit of Roane mountain." Var. *americana* had had an earlier but invalid publication in synonymy. In his *Catalogue of Canadian Plants*, ii. 391 (1890) Macoun published the following note:

(2763.) **A. canina**, Linn.; Macoun, *Cat.* IV., 198.

Prof. Scribner says of this species: "This is *A. rubra*, Linn. May be called *A. rubra*, Linn., var. *Americana*. It is the same as *A. rupestris*, Chapm. (non All.), found on Roan Mountain, North Carolina. The same plant grows on the White Mountains of New Hampshire (*A. canina*, var. *alpina*, Oakes) together with the true *A. rupestris* All." (Scribner.) Our specimens from Mount Albert, Gaspé, Q., belong to *A. rubra*, var. *Americana*. (*Macoun*.)

Macoun's publication may be viewed in different ways. It may be said that he published *A. rubra*, var. *americana* in synonymy (under *A. canina*), in which case he gave it no nomenclatural status; consequently Scribner's later account was the first *valid* publication of the name. If it be maintained that Macoun's publication was valid, then the only characterization of the new variety is Chapman's description of the Roan Mt. plant as *A. rupestris*. In either case the result



FIG. 1, *CAREX INCURVA*, var. *SETINA* from Newfoundland; FIG. 2, *C. LANGEANA* from Newfoundland; both $\times 1$.

is the same; the Roan Mt. plant has the large spikelets of *A. Pickeringii* Tuckerm. and *A. novae-angliae* Vasey, not Tuckerm., though it is a low and narrow-leaved form.

Var. **paludosa** (Scribn.), n. comb. *A. paludosa* Scribn. U. S. Dept. Agric. Div. Agrost. Bull. no. 11: 49 (1898); Hitchc. U. S. Dept. Agric. Bur. Pl. Ind. Bull. 68: 53, 54, fig. 2 (1905); Fernald, RHODORA, xxviii. 118, 161 (1926). *A. melaleuca* Fernald, l. c. 63, 109, 161 (1926), not Hitchc.—LABRADOR, northwestern Newfoundland and eastern Saguenay Co., Quebec. LABRADOR: rocky beach, Tikkoatokok Bay, lat. 57°, *Bishop*, no. 58. NEWFOUNDLAND: springy swale south of the Hospital, Flower Cove, *Fernald, Long & Dunbar*, no. 26,280 as *A. melaleuca*; boggy swale near the Rock Marsh, Flower Cove, *Fernald, Pease & Long*, no. 27,481, *Fernald*, no. 27,483, both as *A. melaleuca*; dripping quartzite cliffs and ledges, upper Deer Pond Brook, Highlands of St. John, *Fernald & Long*, no. 27,482, as *A. melaleuca*; dry gravelly limestone barrens, St. John Island, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, no. 27,479 (starved specimen); dry gravelly limestone barrens, Pointe Riche, *Fernald, Long & Fogg*, no. 1308 (starved specimen). QUEBEC: in barren spots on the gneiss plain, Blanc Sablon ("Labrador"), *Fernald & Wiegand*, no. 2528 (the type was collected by Waghorne at Blanc Sablon); sand-dunes, Blanc Sablon River ("Labrador") *Fernald, Wiegand & Long*, no. 27,480; "Labrador," *Martin*; rocky crest, Ile Ouapitagone, *St. John*, no. 90,123.

Fernald, Long & Dunbar, no. 26,253 from Flower Cove, Newfoundland, and *Wiegand, Gilbert & Hotchkiss*, no. 27,477 from Deer Pond Brook, Newfoundland, have the panicle-branches strongly ascending as in var. *paludosa* but many of their lemmas are awned as in var. *americana*.

*AGROSTIS SCABRA Willd., forma **Tuckermani**, f. nov., lemmatibus aristigeris.—Rarely through the range of the typical awnless form, Newfoundland to New England. TYPE: sandy flats of Monatiquoit River, above Union Street, Braintree, Massachusetts, July 1, 1911, *J. R. Churchill* (in Gray Herb.). The Newfoundland collections are from CONCEPTION BAY: talus of sandstone cliffs, Western Bay, *G. S. Torrey*, no. 111. FORTUNE BAY: silicious gravelly slope, Harbour Breton, *Fernald, Long & Dunbar*, no. 26,250.

Agrostis scabra Willd. Sp. Pl. i. 370 (1798) is the plant which long correctly passed under that name. In 1905 it was merged by Hitchcock, N. Am. Sp. Agrostis (U. S. Dept. Agric. Bur. Pl. Ind. Bull. no. 68), 42, with *A. hyemalis* (Walt.) BSP. Prelim. Cat. N. Y. 68 (1888), which, in turn, was based on *Cornucopiae hyemalis* Walt. Fl. Carol. 73 (1788). Walter lived at Santee, South Carolina; consequently it is natural to identify his *C. hyemalis* as a plant of eastern South Carolina.

According to Hitchcock there is no specimen preserved in the Walter herbarium but Walter's brief diagnosis well describes the common plant of South Carolina:

hyemalis. 1. culmo erecto, panicula diffusa verticillata, foliis angustis subteretibus [misquoted by Hitchcock "sub-erectibus"].

This, so far as it goes, sufficiently describes the species (PLATE 246; FIGS. 1, 2 and *a*) of eastern Virginia, North and South Carolina, Georgia and Florida, which begins flowering in early spring (March and early April; northward, in New Jersey, southern New York and southern New England in May), the beautifully distinct species clearly characterized, 120 years after Walter, as *Agrostis antecedens* Bicknell, Bull. Torr. Bot. Cl. xxxv. 473 (1908). This southern early-flowering species (PLATE 246, FIGS. 1 and 2), with mostly involute-filiform leaves and very lax panicles mostly 0.5–2 (rarely –3) dm. long, has the filiform branches simple or forked only near the tip; the tiny spikelets (1.2–2 mm. long) subsessile or only short-pedicelled and crowded in close spiciform terminal glomerules 2–10 mm. long; the tips of the glumes distant in fruit (FIG. *a*), thus exposing the grain; the lemma 0.5–1 mm. long; the tiny (about 0.2 mm. long) anthers roundish. It is common from Florida to Texas, extending north on and near the Coastal Plain to Rhode Island and Massachusetts, and in the interior to Kansas, Iowa, Illinois and Indiana; it abounds in Walter's region.

Agrostis scabra is coarser throughout, with cauline leaves usually broader and flat; the panicle, when well developed much larger, with the branches forking lower down and in maturity gibbous at base; the spikelets mostly longer-pedicelled, 2–4.3 (in typical *A. scabra* 2–3) mm. long; the glumes connivent in fruit, covering the grain; the lemmas 1.3–2.5 (in typical *A. scabra* 1.3–2) mm. long; the anthers larger and elongate. *A. scabra* in its various forms abounds from Labrador and Newfoundland to Alaska, south to Pennsylvania, the Great Lakes states, Iowa, Nebraska, New Mexico, Arizona and California. In the region where its range meets that of *A. hyemalis* (*A. antecedens*), *A. scabra* begins flowering when the former is wholly mature, from late June to August. This mid-summer species does not reach Walter's country and the name *hyemalis* would be meaningless if applied to it; for a plant which begins flowering in March and which, in the South, is mature in April it is at least less inappropriate. Willdenow's

characterization of *A. scabra* was clearly based on the coarser and more northern plant: . . . “Folia linearia . . . Panicula ramosa divaricata ampla, fere pedalis,” etc.

Agrostis scabra, f. *Tuckermani* is unquestionably the plant from “Notch of the White Mountains” described as *A. laxiflora*, β *montana* Tuckerm. Am. Journ. Sci. xlv. 43 (1843) “palea arista tortili exserta e medio dorsi proveniente praedita.” Tuckerman’s plant is in the Gray Herbarium but, unfortunately, he involved the typification by citing as its nomenclatural basis “*Trichodium montanum*, Torr. (fide ips.) Torr. Fl. i. 84.” The original description of *T. montanum* Torr. Compend. 50 (1826) mentions no awn; and, although Hitchcock (N. Am. Sp. Agrost. 43) says “In the mountains of New England is a form which has awned spikelets. . . . This form has been named—*Trichodium montanum* Torr., Comp. 50. 1826,” he states very definitely that “Torrey’s specimen is in the Torrey herbarium . . . the flowering glume is awnless” and the type of the “New England” plant was “collected on ‘summit of the New Beacon, Fishkill [New York]’”. With the typification of *A. laxiflora*, β . *montana* thus involved, it is wiser to redesignate the form of *A. scabra* with awned lemmas and to assign it an unequivocal type.

The name *Agrostis laxiflora* Richardson (1823) goes back to *Trichodium laxiflorum* Michaux, Fl. Bor.-Am. i. 42, t. 8 (1803). Michaux’s plate shows very characteristic *A. hyemalis* (*A. antecedens*) and he cited as an unquestioned synonym *Cornucopiae hyemalis* Walt. *A. aphanes* Trin. Agrost. ii. 100 (1841) from Newfoundland is presumably a green state of *A. scabra*. Its flat leaves, more or less spreading panicle “*lucidissimae*,” its hispid rays up to 3½ inches long, its awnless lemma and its short-pilose callus are all characters of *A. scabra*.

A. SCABRA*, var. **septentrionalis var. nov. (TAB. 246, FIGS. 3 and *b*), spiculis 3.2–4.3 mm. longis; glumis lanceolato-attenuatis apice subaristatis; lemmatibus 2–2.5 mm. longis.—Labrador to Nova Scotia. LABRADOR: sandy shore of island near mouth of Naskaupi River, Lake Melville, August 4, 1921, *Wetmore*, no. 103,103. NEWFOUNDLAND: dry sterile meadow at head of Mauve Bay, August 12, 1925, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, no. 27,468; glades in spruce swamp, Brig Bay, Aug. 7, 1924, *Fernald, Long & Dunbar*, no. 26,252; open savannah near mouth of Main River, Bonne Bay, August 27, 1929, *Fernald & Long*, no. 1306; dry serpentine slopes near Winterhouse Brook, Bonne Bay, August 8, 1929, *Fernald, Long & Fogg*, no. 1310 (TYPE in Gray Herb.); St. George’s, July 29, 1922,

Mackenzie & Griscom, no. 11,144; wet thicket on gneiss hills, Burgeo, September 15, 1926, *Fernald, Long & Fogg*, no. 81 (many spikelets modified by nematodes); knolls in wet bog-barrens, Trepassey, August 16, 1924, *Fernald, Long & Dunbar*, no. 26,252. QUEBEC: près des chutes, Natashquan, 31 juillet, 1928, *Victorin & Rolland*, no. 28,097; various stations, Anticosti, *Victorin & Rolland*, nos. 27,818–27,822. MAGDALEN ISLANDS: wet bogs among the sand ridges back of the Narrows, Alright Island, August 21, 1912, *Fernald, Long & St. John*, no. 6850; Grand-Étang sur la Dune du Nord, Ile de la Grande-Entrée, 9 août, 1919, *Victorin & Rolland*, no. 9017; sprawling in dry clearing, Brion Island, August 8, 1914, *St. John*, no. 1766. NOVA SCOTIA: swampy edge of fresh water pond and dune hollows, Sable Island, August 27 and 30, 1913, *St. John*, nos. 1165, 1166; springy sphagnous bog in spruce woods near mouth of Broad River, August 16, 1920, *Fernald & Bissell*, no. 19,913; dryish sphagnous swales and bogs by Harris's Lake, Tiddville, August 22, 1920, *Fernald & Long*, no. 19,914; swampy spruce woods and thickets by Minnigobake Lake, Belleville, July 29, 1920, *Long & Linder*, no. 19,900; wet peaty sloughs in barrens, Lower Argyle, August 11, 1920, *Fernald, Bissell, Graves, Long & Linder*, no. 19,911, in part; sphagnous swales bordering Salmon (Greenville) Lake, August 13, 1920, *Fernald, Bissell, Graves, Long & Linder*, no. 19,912; wet savannah bordering Goven Lake, July 23, 1921, *Fernald, Bartram & Long*, no. 23,267.

*Var. SEPTENTRIONALIS, forma **setigera**, f. nov., lemmatibus setigeris.—Range of the awnless form, often more abundant. NEWFOUNDLAND: swampy woods, Bell Island, Conception Bay, August, 1901, *Howe & Lang*, no. 1302; Grand Lake, 1908, *Owen Bryant*; serpentine tableland, alt. 380 m., Bonne Bay, August 27, 1910, *Fernald & Wiegand*, no. 2514; open peat bogs, Birchy Cove (Curling), August 10, 1910, *Fernald & Wiegand*, no. 2513; sphagnous marsh, Lark Harbor, August 31, 1926, *Fernald, Long & Fogg*, no. 78; dry meadows, Bay St. George, August 5–7, 1901, *Howe & Lang*, no. 1013; wet moss and peat on the gneiss hills near Sand Bank, west of Burgeo, September 9, 1926, *Fernald, Long & Fogg*, no. 79 (TYPE in Gray Herb.); crests and crevices of gneiss ledges, Burgeo, September 10 and 15, 1926, *Fernald, Long & Fogg*, nos. 80, 84, 85. QUEBEC: gneiss ledges, Mutton Bay, September 7, 1925, *Fernald & Long*, no. 27,467; sur les rochers granitiques près de l'embouchure, Rivière Romaine, 20 juillet, 1925, *Victorin, Rolland & Louis-Marie*, no. 20,635. MAGDALEN ISLANDS: sphagnous boggy margin of pond, southeast of Étang du Nord, and dry open woods and clearings, Étang du Nord, Grindstone Island, July 24, 1912, *Fernald, Bartram, Long & St. John*, nos. 6847, 6848; wet bogs and mossy pond-margins, between East Cape and East Point, Coffin Island, August 17, 1912, *Fernald, Long & St. John*, no. 6851; dunes de la Pointe de l'Est, 29 juillet, 1919, *Victorin & Rolland*, no. 9018. NOVA SCOTIA: peat bog at head of White Spring, St. Paul Island, August 6, 1929, *Perry & Roscoe*, no.

51; Canso, July 18, 1901, *Fowler*; spruce swamp, Markland (Cape Forchu), August 22, 1921, *Fernald & Long*, no. 23,272.

When not called *Agrostis scabra* or *A. hyemalis*, *A. scabra*, var. *septentrionalis* (including f. *setigera*) has been distributed either as *A. borealis* Hartm., *A. geminata* Trin., *A. elata* (Pursh) Trin., *A. hyemalis* var. *geminata* (Trin.) Hitchc. or *A. hyemalis*, var. *elata* (Pursh) Fern. From *A. borealis* it is at once separated by its long and flexuous strongly hirtellous branches which place it with *A. scabra*. From *A. geminata* it is distinguished by the very diffuse and flexuous prolonged branches, the panicle $\frac{1}{3}$ – $\frac{2}{3}$ the full height of the plant, the mature and strongly divergent or reflexed branches strongly gibbous at base, and the ligules 4–7 mm. long; *A. geminata* having the mature panicle smaller and more regularly ovoid, only $\frac{1}{6}$ –very rarely $\frac{1}{2}$ the full height of the plant, its stiffer or merely arching shorter branches scarcely gibbous at base and the ligule of the usually shorter cauline leaves 1.5–rarely 4 mm. long. *A. scabra* var. *septentrionalis* has often been confused with the southern Coastal Plain *A. elata* (Pursh) Trin. and when I made the combination *A. hyemalis* var. *elata* (Pursh) Fern. RHODORA, xxiii. 229 (1922) I was influenced by the fact that the plant of Nova Scotia, the Magdalen Islands and Newfoundland is clearly an extreme of *A. scabra* (at that time confused with *A. hyemalis*). In *A. elata*, however, the cauline leaves are numerous (5–10), in *A. scabra*, var. *septentrionalis* only 2–4; the panicle is lanceolate to narrowly ovoid, not diffuse; and the lemma is conspicuously dark-nerved, nearly as long as the glumes, the lemma of *A. scabra* not evidently nerved and much shorter.

AGROSTIS GEMINATA Trin., forma **exaristata**, f. nov., lemmatibus muticis exaristatis.—Throughout the range of the typical form with awned lemmas, often more abundant. TYPE: muddy border of small lake at about 530 m. alt., back of North Fork Camp, North Fork of Madeleine River, Gaspé Co., Quebec, August 12, 1923, *Fernald, Dodge & Smith*, no. 25,485 (in Gray Herb.).

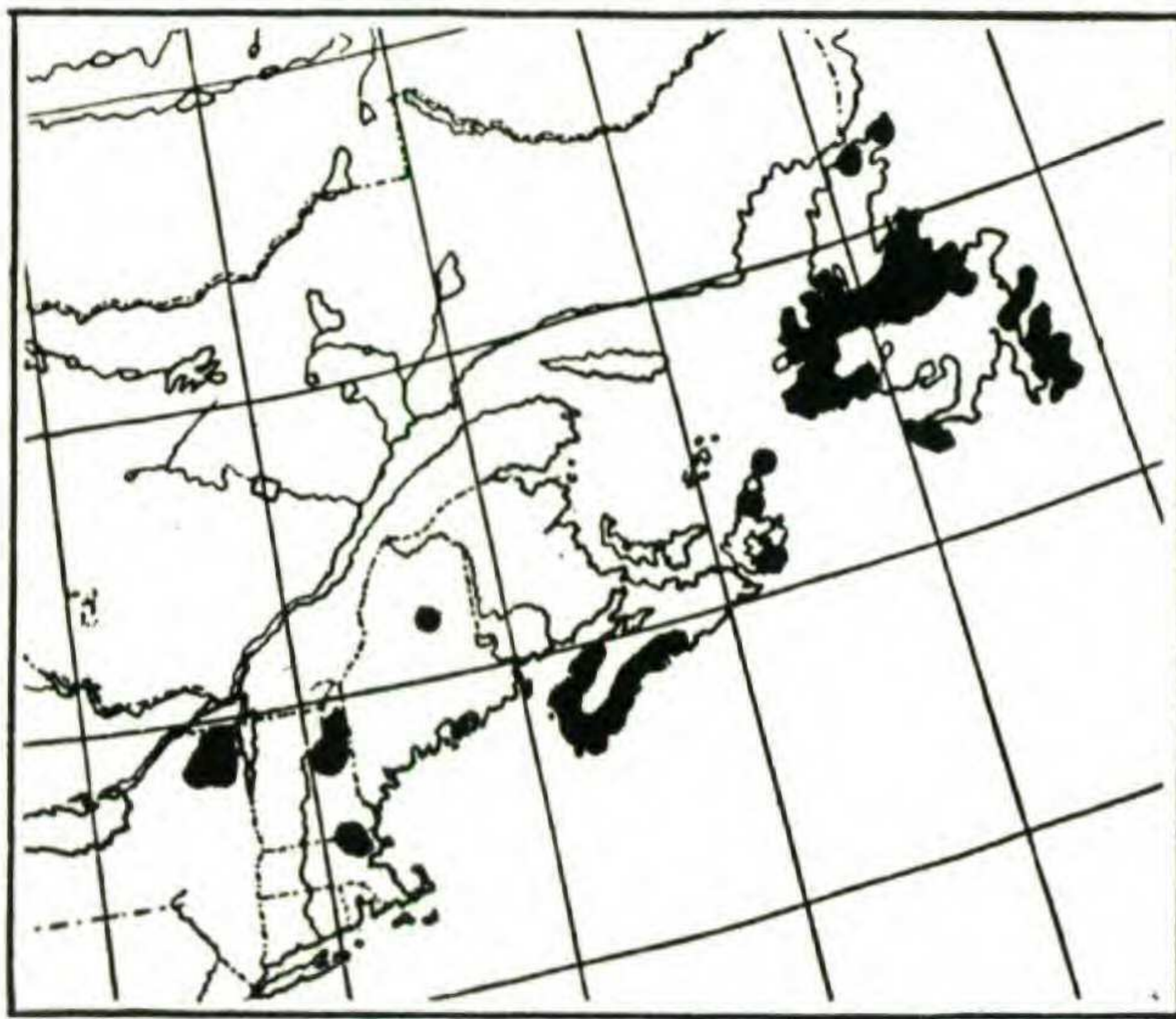
Although *Agrostis geminata* is treated by Hitchcock as a variety of *A. hyemalis* (i. e. *A. scabra*), and where the two grow together they seem to merge, the same may be said of *A. geminata* and *A. borealis* Hartm. *A. geminata* is one of the strong links in a chain of somewhat confluent species (*A. scabra*, *A. perennans* Tuckerm., *A. elata* (Pursh.) Trin., *A. geminata*, *A. borealis* and *A. canina* L.; and doubtless others.) Only confusion would result from merging them all as one species. It seems better to treat them as reasonably distinct

species which at their meeting-places are occasionally interfertile. Such conditions are familiar in many northern groups.

The Newfoundland collections of

**A. GEMINATA*, f. *EXARISTATA* are the following. AVALON PENINSULA: dry peaty or gravelly silicious barrens, Trepassey, *Fernald, Long & Dunbar*, no. 26,263. STRAITS OF BELLE ISLE: wet boggy tundra, Quirpon Island, *Fernald & Long*, no. 27,471. HA-HA BAY: trap ledges, Piton Point, *Wiegand, Gilbert & Hotchkiss*, no. 27,469. INGORNACHOIX BAY: limestone barrens, Pointe Riche, *Fernald, Wiegand & Kittredge*, no. 2527. CAPE ST. GEORGE: dry limestone barrens, Green Gardens, *Mackenzie & Griscom*, no. 11,080.

CALAMAGROSTIS PICKERINGII Gray. and var. *DEBILIS* (Kearney) *Fernald & Wiegand*. MAP 20. Both of general range over southern,



Map 20. Range of *CALAMAGROSTIS PICKERINGII*.

central and eastern Newfoundland and in the East extending to the eastern shores of the Straits of Belle Isle. Near the West Coast our northernmost stations are the tablelands of Bonne Bay.

As an apparently old type, of pre-Wisconsin dispersal, *Calamagrostis Pickeringii* is notable. Dominant on peaty barrens at all levels in Newfoundland and Nova Scotia, it is absent from New Brunswick and most of Maine, but reappears in the alpine areas of Mt. Katahdin, the White Mts., the northern Green Mts. and the Adirondacks, whence it occasionally descends to the valleys. It has an isolated area in northeastern Massachusetts and adjacent southeastern New Hampshire (where the long-weathered till gives evidence of very early, rather than recent, glaciation); and there is an outlying area for a related plant (perhaps specifically separable) in northern Michigan. The range of the species is, emphatically, a disrupted one. The nearest allies of *C. Pickeringii* (sharing with it the prolonged and geniculate or twisted awn) are *C. Porteri* Gray and *C. perplexa* Scribn. *C. Porteri* is one of the rarest of relic-species, with four isolated stations: one each, on rocky wooded slopes, in Chemung Co., New York; Huntingdon Co., Pennsylvania;

and Page and Giles Cos., western Virginia. *C. perplexa* is even rarer: with the original station a bluff in Tompkins Co., New York, the other (for a similar but not quite identical plant) a quartzite cliff in Piscataquis Co., Maine.

Also having a geniculate and exserted awn is the arctic *Calamagrostis purpurascens* R. Br., likewise with a remarkably disrupted range: the unglaciated margin of Greenland; arctic northwestern Canada, thence along the Cordillera to South Dakota, Colorado, Nevada and California; with the only known station in the East (south of Greenland) a single colony on one of the highest cliffs of Bic, Quebec.¹

The senility of this group of relic-species is in striking contrast to the aggressive and hopelessly variable complex which we call *Calamagrostis canadensis* (Michx.) Nutt., dominant and continuously spread across the cool-temperate, only recently available (since the Wisconsin) regions of Canada and the Northern States.

C. INEXPANSA Gray, var. *ROBUSTA* (Vasey) Stebbins, RHODORA, xxxii. 48 (1930). *C. hyperborea*, in part, of Newfoundland records, not Lange. One of the commonest grasses of western Newfoundland, chiefly in calcareous or magnesian soils, both wet and dry and at all altitudes. Our northern-most station is on the STRAITS OF BELLE ISLE: Rock Marsh, Flower Cove, *Fernald, Long & Dunbar*, no. 16,272; the most southern on PORT AU PORT BAY: Table Mt., *Fernald, Wiegand & Kittredge*, no. 2558. From central Newfoundland we know it from Grand Lake, *Waghorne*, no. 43; and Bishop Falls, *Fernald, Wiegand & Darlington*, no. 4582.

Except for its occurrence in Newfoundland and the closely allied region of Quebec (Côte Nord, Mingan Islands, Anticosti and Gaspé) var. *robusta* is cordilleran.

¹ Typical *Calamagrostis purpurascens* occurs in easternmost Asia, south, locally, to the highest mountains of Japan. It is *C. purpurascens*, var. *parvigluma* (Takeda) Miyabe & Kudo, Journ. Fac. Agr. Hokkaido Imp. Univ. Sapporo, xxvi. pt. 2: 145 (July 15, 1931), based on *C. urelytra*, β . *parvigluma* Takeda, Tokyo Bot. Mag. xxiv. 37 (1910). Miyabe & Kudo treat *C. urelytra*, α . *macrantha* Takeda with "Glumis sterilibus 8-10-12 mm longis" as typical *C. purpurascens* R. Br. and they transfer his *C. urelytra*, β . *parvigluma* with "Glumis sterilibus 6-7 mm longis" to varietal rank under *C. purpurascens*. Three plants of Richardson's original material upon which *C. purpurascens* R. Br. was based, preserved in the Gray Herbarium, and spikelets from the type sent by Hooker to Asa Gray show the glumes to be consistently 5.5-6.5 mm. long. Consequently, *C. purpurascens*, var. *parvigluma* (*C. urelytra*, var. *parvigluma*) is scarcely separable from it. The plant of northern Japan and the Kurile Islands with extraordinarily large spikelets ("Glumis sterilibus 8-10-12 mm longis") is, then, the extreme departure from typical *C. purpurascens*. It becomes

CALAMAGROSTIS PURPURASCENS R. Br., var. **MACRANTHA** (Takeda), comb. nov. *C. urelytra* Hack., α . *macrantha* Takeda, Tokyo Bot. Mag. xxiv. 36 (1910). *C. purpurascens* Miyabe & Kudo, Journ. Fac. Agr. Hokkaido Imp. Univ. Sapporo, xxiv. 146 (1931), not R. Br.

C. INEXPANSA, var. *BREVIOR* (Vasey) Stebbins, l. c. 50. *C. hyperborea elongata* and *hyperborea americana* Kearney. Judged by the number of collections, much less common than var. *robusta*. The Newfoundland collections identified by Stebbins are the following. VALLEY OF THE EXPLOITS: ledges, talus and gravel (calcareous), Grand Falls, *Fernald, Wiegand, Bartram & Darlington*, nos. 4583, 4584; rocky shore, Buchan Junction, July 19, 1930, *K. P. Jansson*. HIGHLANDS OF ST. JOHN: dry white limestone bluff opposite western escarpment of Bard Harbor Hill, *Fernald & Long*, no. 27,498. ST. JOHN BAY: swale back of beach, Bard Harbor, *Wiegand, Gilbert & Hotchkiss*, no. 27,497. BONNE BAY: thicket bordering marl-pond, Storehouse Cove, *Fernald, Long & Fogg*, no. 1322; limestone cliffs and talus, Tucker's Head, no. 1323; open savannah and springy swale near mouth of Main River, *Fernald & Long*, nos. 1324, 1325. VALLEY OF THE HUMBER: dry limestone gravel, Hannah's Head, *Fernald & Long*, no. 1318. CAPE ST. GEORGE: headlands of the Cape, *MacKenzie & Griscom*, no. 11,117.

All other material distributed by me as *Calamagrostis hyperborea* belongs to *C. inexpansa*, var. *robusta*.

C. NEGLECTA (Ehrh.) Gaertn., Meyer & Scherb. See Stebbins, l. c. 53. In Newfoundland *C. neglecta* is far less common than the varieties of *C. inexpansa*. The following are identified by Stebbins as typical. SACRED BAY: bog barren ("mesh") south of Ship Cove, *Fernald, Wiegand & Long*, no. 27,492. PISTOLET BAY: gravelly and turfy strand near Isthmus Cove, *Wiegand, Gilbert & Hotchkiss*, no. 27,491. ST. JOHN BAY: turf overlying limestone, Savage's Island, *Fernald, Long & Fogg*, no. 1315. PORT AU PORT BAY: wet runs and boggy spots in limestone barrens, Table Mt., *Fernald, Wiegand & Kittredge*, no. 2548.

The first two numbers were erroneously distributed as Var. *borealis*.

C. NEGLECTA, var. *BOREALIS* (Laestad.) Kearney. Rare. PISTOLET BAY: tundra on southern half of Burnt Cape, *Fernald & Long*, no. 27,490. STRAITS OF BELLE ISLE: swales and wet peaty limestone barrens, Capstan Point, Flower Cove, *Fernald, Long & Dunbar*, no. 26,270. VALLEY OF THE HUMBER: sandy lake-side, Grand Lake, *Waghorne*, no. 41.

MUHLENBERGIA UNIFLORA (Muhl.) Fern., var. *TERRAE-NOVAE* Fern. RHODORA, xxix. 11 (1927). PLATE 241, FIGS. 1 and 2. Reaching its northern limit, apparently, on the tableland of Lookout Mt., Bonne Bay.

As pointed out in the original discussion of var. *terrae-novae*, it often has the spikelets with 2 or 3 florets, thus making a strong departure from typical species of *Muhlenbergia* and from the theoretical 1-flowered *Agrostideae* toward *Eragrostis* of the more primitive *Festu-*

ceae. Judged by this greater development of 2-flowered spikelets in var. *terrae-novae*, it would seem to be more primitive than the continental typical *M. uniflora*, with the spikelets mostly 1-flowered.

PHLEUM ALPINUM L. In Newfoundland known only from wet, or at least damp, situations. Its southernmost known station there is on BONNE BAY: turfy slopes below limestone crest (alt. 630 m.), Killdevil, *Fernald, Long & Fogg*, no. 1327.

In view of the preference of *Phleum alpinum* for wet slopes or meadows, it is interesting, as a corollary of the principle discussed at the close of Part II (that the Arctic flora is essentially xerophytic and that it is the xerophytic Arctic species which abound on the arid rock-barrens of the West Coast) to note that *P. alpinum* was not listed by Simmons as occurring on the Arctic Archipelago and that in Greenland its northern limit is at lat. 70° (*vide* Ostenfeld).

ORYZOPSIS ASPERIFOLIA Michx. In Newfoundland this species, of dry deciduous forest in the northeastern United States, seems to occur chiefly in the "thin thickets" bordering open barrens. In central Newfoundland it is sometimes in well developed woods, but along the West Coast it follows the limestone and serpentine barrens, as characteristic of the tablelands as of lower levels. The northernmost stations are on ST. JOHN BAY: knoll in spruce thicket (on limestone), St. John's Island, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, no. 27,510; peaty thicket bordering limestone barrens, Old Port au Choix, *Fernald, Long & Fogg*, no. 1331. Compare statements regarding *Habenaria orbiculata* (pp. 8, 87) and *H. Hookeri* (p. 57).

O. CANADENSIS (Poir.) Torr. (*Oryzopsis pungens* (Torr.) Hitchc.; *Stipa canadensis* Poir.). Probably of general occurrence in central and southern Newfoundland. The specimens at hand are few. VALLEY OF THE EXPLOITS: granitic ledges and gravel along a brook, Quarry, *Fernald, Wiegand & Bartram*, no. 4529; moist woods, Buchan Junction, July 12, 1930, *K. P. Jansson*. BAY OF ISLANDS: diorite tableland, alt. about 550 m., Blomidon, *Fernald & Wiegand*, no. 2490, *Mackenzie & Griscom*, no. 10,063; peaty and turfy subalpine meadow, Lark Mt., *Fernald, Long & Fogg*, no. 104. DISTRICT OF BURGEO AND LA POILE: in *Cladonia*-heath on dry gneiss slopes along Grandy Brook, *Fernald, Long & Fogg*, no. 105.

SPARTINA PECTINATA Link. Extended north to BONNE BAY: gravel along Deer Brook, *Fernald, Long & Fogg*, no. 1333.

ELEOCHARIS PARVULA (R. & S.) Link (*Scirpus nanus* Spreng.). Extended north to BONNE BAY: brackish gravel-flat at mouth of McKenzie River, *Fernald, Long & Fogg*, no. 1337.

E. UNIGLUMIS (Link) Schultes, var. HALOPHILA Fern. & Brackett, RHODORA, xxxi. 72, t. 183 (1929). Extended north from Bay St.

George, to BONNE BAY: brackish tidal mud-flats at mouth of Main River, *Fernald, Long & Fogg*, no. 1341.

**E. ACICULARIS* (L.) R. & S., var. *SUBMERSA* (Hj. Nilss.) Svenson, *RHODORA*, xxxi. 188 (1929). The first station known south of the Labrador Peninsula is on BONNE BAY: brackish mud-flats at mouth of Main River, *Fernald, Long & Fogg*, no. 1344. See p. 90.

SCIRPUS CESPITOSUS, var. *DELICATULUS* Fern., *RHODORA*, xxiii. 25 (1921). To the original Newfoundland station on the Gander River may be added one on BONNE BAY: gravel along Deer Brook, *Fernald, Long & Fogg*, no. 1349.

S. AMERICANUS Pers. Extended north to BONNE BAY: tidal mud and gravel at mouth of Main River, *Fernald & Long*, no. 1354; plants all sterile.

S. ACUTUS Muhl. The northernmost known station is on BAY OF ISLANDS: marshy border of pond at foot of serpentine ridge, North Arm, *Long & Fogg*, no. 113.

ERIOPHORUM OPACUM (Bjornstr.) Fern. See *RHODORA*, xxvii. 208 (1925). Extended south to ST. JOHN BAY and INGORNACHOIX BAY: damp open depressions in limestone barrens, Old Port au Choix and Pointe Riche, *Fernald, Long & Fogg*, nos. 1359, 1360.

**RYNCHOSPORA CAPILLACEA* Torr., var. *LEVISETA* E. J. Hill. BONNE BAY: bogs, July 26, 1930, *K. P. Jansson*; the first station east of the Kennebec River, Maine, although typical *R. capillacea* occurs on the Gaspé Peninsula.

CAREX INCURVA Lightf. Extended south to ST. JOHN BAY: turf overlying limestone, Grassy Island and Savage's Island, *Fernald, Long & Fogg*, nos. 1371, 1372; very luxuriant colonies, up to 2.1 dm. high. See p. 60.

**C. INCURVA* Lightf., var. *SETINA* Christ in Scheutz, *Pl. Vasc. Jeniseens.* 174 (1888)—*Kongl. Svensk. Vet.-Akad. Handl.* xxii. No. 10: 174 (1888). Damp clay and gravel of limestone barrens, Gargamelle Cove, Ingornachoix Bay, *Fernald, Long & Fogg*, no. 1373. PLATE 247, MAP 4, p. 56.

The type of var. *setina* came from lat. 70° 10', near the mouth of the Jenisei. I have seen none of the original material but our plant is quite like the collection from Advent Bay, Spitzbergen, August 8, 1868, *Th. M. Fries*, which is cited by Kükenthal in *Engler, Pflanzenr.* iv²⁰. 114 (1909) as var. *setina*. Kükenthal cites other specimens from Samojeden, Nova Zembla, Tschutchesland and western Greenland; and in the Gray Herbarium there are specimens from Jugor Straits, Arctic Russia; Jan Mayen; western Greenland and Ellesmereland; all close to or to the north of the Arctic Circle. The occurrence at sea-level at lat. 50° 43' in western Newfoundland of this characteristically Arctic extreme of the species adds another to the many records of

Arctic types from that region. Kükenthal's description, "Culmus humilis subabsconditus. Spiculae pauciores pauciflorae" covers the essential points of the variety but the following more detailed contrast with typical *C. incurva* may be of value.

C. INCURVA (typical). Culms up to 25 cm. long; leaves up to 15 cm. long; fruiting head 8–14 cm. in diameter; perigynia 3.5–5 mm. long.

Var. *SETINA*. Culms 1 mm.–2 cm. long; leaves 1–3.5 cm. long; fruiting head 4–7 mm. in diameter; perigynia 3–3.5 mm. long.

Kükenthal refers to *Carex incurva*, var. *setina* the Greenland plant described and illustrated by Lange as *C. duriuscula* Lange, Fl. Dan. xvi. fasc. xlvi. 10, t. mmdeccxliii (1871). Lange supposed his plant to be *C. duriuscula* C. A. Meyer. That it is quite distinct from both *C. duriuscula* C. A. Meyer and from *C. incurva*, var. *setina* will appear in the discussion of the next species.

**CAREX Langeana*, nom. nov. *C. duriuscula* Lange, Fl. Dan. xvi. fasc. xlvi. 10, t. mmdeccxliii (1871), as to Greenland plant, not C. A. Meyer, Mém. Acad. St. Pétersb. i. 214, t. VIII (1831). PLATE 247.

A plant of western Newfoundland, forming close turf on dry peaty limestone barrens bordering Gargamelle Cove, Ingornachoix Bay, Fernald, Long & Fogg, no. 1374, seems to be quite identical with the plant described and beautifully illustrated by Lange as *C. duriuscula*. Lange supposed the Greenland plant to be *C. duriuscula* C. A. Meyer and in his *Conspectus Florae Groenlandicae*, 134 (1880) and pt. 2: 288 (1887) he so maintained it, in each case holding it as specifically distinct from the well-known *C. incurva* Lightf., next which species Lange placed his *C. duriuscula*. *C. duriuscula* C. A. Meyer, as indicated in his description and plate, has the bracts ovate and acuminate, the scales of the spike ovate and acute to merely obtuse, the anthers conspicuously apiculate and the perigynia 7-nerved and toward the summit serrulate. It belongs, then, close to *C. stenophylla* Wahlenb. which shares these characters and by Trautvetter, Kükenthal and others has been referred, at least as a variety, to that species. In the Greenland plant of Lange and in the plant of western Newfoundland identified with it, the bracts are broader and rounded at summit, the anthers are blunt and the nerveless perigynia are barely roughened on the margin toward the tip; it is certainly not the same as *C. duriuscula* C. A. Meyer.

Kükenthal and other European students refer *Carex duriuscula* Lange, not C. A. Meyer, without question to *C. incurva* Lightf. or to its dwarf var. *setina* Christ; and in his treatment in *Das Pflanzen-*

*reich*¹ Kükenthal emphasizes his reduction of it by a mark of affirmation. Nevertheless, *C. incurva*, var. *setina*, which occurs in western Newfoundland on the same barren with *C. Langeana*, has there, as in the material from Greenland, Jan Mayen, Spitzbergen and arctic Siberia, the globose or subglobose inflorescences characteristic of all *C. incurva*, and very thin and scarious or hyaline whitish or broadly white-bordered divergent scales; *C. Langeana* has ellipsoid or thick-cylindric spikes with firmer and deep-ferruginous appressed-ascending scales with only a narrow pale border. The anthers of *C. incurva* are 1.7–2.5 mm. long, of *C. Langeana* only 1 mm. long; the perigynium of *C. incurva* is plump or subinflated, that of *C. Langeana*, as shown by Lange's immature material and by the Newfoundland collection, flat. The leaves of *C. incurva* are smooth or only slightly scabrous toward the tip; those of *C. Langeana* definitely spinulose-scabrous. It is not, therefore, satisfactory to refer *C. duriuscula* Lange (*C. Langeana*) to *C. incurva*. Lange himself, who certainly knew *C. incurva*, held them to be distinct, and the characters of the two justify his decision.

It is possible that *C. Langeana* had its origin by the crossing of *C. gynocrates* Wormsk. with *C. incurva* or *C. incurva*, var. *setina*. In the region of Newfoundland where it occurs *C. gynocrates* and *C. incurva* are common and the station for *C. Langeana* is very near our station for *C. incurva* var. *setina*. The latter as well as the larger extremes of *C. incurva* and *C. gynocrates* often fruit abundantly; while the achenes of *C. Langeana* are not well developed. Superficially *C. Langeana* strongly suggests the Arctic-European *C. Deinbolleana* Gay, which is generally accepted as a hybrid of *C. dioica* L. and *C. incurva*. The Newfoundland and Greenland representative of *C. dioica* is *C. gynocrates* and, crossed with *C. incurva*, it would undoubtedly produce a plant strongly simulating *C. Deinbolleana*. On the other hand, sterility is only negative evidence of hybrid origin. *C. gynocrates* and other unique species are often quite sterile and Simmons specially comments² on the frequent sterility of *C. incurva*. Lange, in his *Conspectus Florae Groenlandicae*, 134 and pt. 2: 288, cites *C. Langeana* (as *C. duriuscula*) from three definite stations; he cites *C. gynocrates* from five stations and *C. incurva* from nine, but in no case is any station for *C. Langeana* identical with any for either *C. gynocrates* or *C. incurva*. Whether the later collections of *C. Langeana*

¹ Kükenthal in Engler, Pflanzenr. IV²⁰. 114 (1909).

² Simmons, Phytogeogr. Arct. Am. Archipel. 60 (1913).

from Greenland have good fruit I do not know, but Lange certainly gave no intimation that the plant he took to be *C. duriuscula* was not a definite species. Until the question can be further checked in the field both in Greenland and in Newfoundland, the possible hybrid origin of *C. Langeana* must remain an open question.

C. WIEGANDII Mackenz. N. Am. Fl. xviii. 108 (1931). Extended north to BONNE BAY: boggy spruce thickets near Winterhouse Brook, *Fernald, Long & Fogg*, no. 1381.

C. CEPHALANTHA (Bailey) Bickn. Range extended north to BONNE BAY: swales on alluvial islands and shores at mouth of Main River, *Fernald, Long & Fogg*, no. 1384.

This material, like some other collections from western Newfoundland, has the perigynia as slender as in *C. angustior* Mackenz. The plant deserves special watching in the field.

C. DEWEYANA Schwein. To the very few Newfoundland stations add the following, ST. JOHN BAY: bushy swale back of Eddy's (Old Man's) Cove, *Fernald, Long & Fogg*, no. 1385. BONNE BAY: turf slopes below limestone crest (alt. 650 m.), Killdevil, no. 1386.

C. SCOPARIA Schkuhr. Range extended north to BONNE BAY: swales on alluvial islands and shores at mouth of Main River, *Fernald, Long & Fogg*, no. 1388.

C. HORMATHODES Fern. Frequent on the South Coast, its northern outposts are on Bonne Bay and Notre Dame Bay. BONNE BAY: alluvial islands and shores at mouth of Main River, *Fernald, Long & Fogg*, no. 1390; brackish swale near mouth of McKenzie River, no. 1391. NOTRE DAME BAY: brackish shore of Dildo Run, *Fernald, Wiegand & Bartram*, no. 4810.

* \times *C. trichina*, nom. nov. *C. tenuiflora* \times *trisperma* Fern. RHODORA, iv. 226 (1902). VALLEY OF THE EXPLOITS: muddy shore, Buchan Junction, July 15, 1930, *K. P. Jansson*.

This hybrid is so wide-spread in occurrence and in the two stations personally known to me, so very abundant (at the type-station so abundant as easily to furnish 100 very full sheets) that it seems more convenient to have a binomial with which to refer to it. The original collection was from an extensive colony at Fort Fairfield, Maine. It is also rather abundant on a boggy shore at Blanc Sablon, Quebec Labrador, *Fernald & Wiegand*, no. 2797; and it was collected at Lansing, Michigan, July 28, 1890, by *G. H. Hicks*.

C. NOVAE-ANGLIAE Schwein. Occasional in the southern districts, the northern known limit on BAY OF ISLANDS: brookside-thicket, French (or Tweed) Island, *Fernald, Long & Fogg*, no. 132.

C. DEFLEXA Hornem. Frequent or common in the southern and central districts, the northern known limit in Newfoundland, whence

it "jumps" to Greenland, is on the HIGHLANDS OF ST. JOHN: mossy shelves of quartzite cliff at head of Yellow Brook, Doctor Hill, *Fernald, Long & Fogg*, no. 1407.

C. CONCINNA R. Br. To the two remote Newfoundland stations previously recorded add POINTE RICHE: turfy talus of limestone sea-cliffs, *Fernald, Long & Fogg*, no. 1410.

**C. GRACILLIMA* Schwein., var. *HUMILIS* Bailey. BONNE BAY: margins of wet thickets along Winterhouse Brook, *Fernald, Long & Fogg*, no. 1426; thickets, gravelly shores and alluvial islands near mouth of Main River, *Fernald, Long & Fogg*, no. 1427.

**C. LIMOSA* × *RARIFLORA* Norman. POINTE RICHE: wet rocky run on shelf of limestone, *Fernald, Long & Fogg*, no. 1435.

Recorded by Kükenthal from a single station each, in Norway and Sweden.

**C. BUXBAUMII* Wahlenb., forma *DILUTIOR* Kükenth. BONNE BAY: swales and margins of wet thickets along Winterhouse Brook, *Fernald, Long & Fogg*, no. 1438.

In its whitish-brown scales very strikingly contrasted with the usual dark-scaled *C. Buxbaumii*.

CAREX ALPINA IN NORTH AMERICA.—In boreal America one of the *Carices* of the *Atratae* long and correctly passed as *C. alpina* Swartz. Recently, however, it has been the fashion to call the species *C. Halleri* Gunnerus, because the name of Gunnerus clearly antedates that of Swartz. If the change rested solely on priority of publication there would be no objection to it; but, unfortunately, Gunnerus did not understand what he was publishing and his name, *C. Halleri*, is a *nomen confusum*.

Carex alpina (*C. Halleri* of many recent authors) has the culms harsh at summit ("superne scaber"—Kükenthal), the leaves with scabrous-serrulate margins and midrib, the scales of the spikes purple or purplish black, without pale midnerve but with a pale hyaline margin ("Squamae ♀ parvulae . . . nigricantes clarius carinatae marginibus anguste albo-hyalinae"—Kükenthal). Its granular-roughened perigynia have an exceedingly short beak ("in rostrum breve . . . contracti"—Kükenthal). With these points in mind it is well to see just what formed the basis of *C. Halleri*. Gunnerus obviously had no material himself; his species was based on references from literature:

DCCCXLIX. CAREX (*Halleri*) spica androgyna: terminali tripartita. *Hall.* 1356. *Oed. fl. dan.* VII. 8. t. 403. *Scheuchz. hist. t.* 11. f. 8. citante Oedero.

Habitat in alpibus. Oeder.¹

Gunn. *Fl. Norv.* ii. 106 (1772).

The plate in *Flora Danica*, although crude, is recognizable as *Carex alpina*; and recent Scandinavian authors and those who have followed them have taken *C. Halleri* in that sense. It should be noted, however, that the name used by Gunnerus clearly indicates that the plant of Haller is primarily intended. Consequently, in interpreting *C. Halleri* chief weight should be given to Haller's very full description. The diagnostic phrases used by Gunnerus were taken directly from Haller's description of his no. 1356. Haller's account of the plant of Switzerland which must be taken as the type of *C. Halleri* Gunn. is so important that it should be quoted:

1356. CAREX spica terminali tripartita.†

Esset *Carex* MICHELI p. 61. f. 5. t. 33. f. 6. nisi collum bifidum diceretur.

An *Cyperoides alpinum tenuifolium*, spica brevi; ferruginea SCHEUCHZER. p. 493. t. 11. f. 8.?

In alpinis reperi, ut in mont. Fouly, valle Trient; misit etiam Cl. BELLARDUS.

Folia radicalia culmo breviora, latiuscula, ad lineam & ultra. Culmus superne nudus, triquetrus, semipedalis; non asper, ut neque folia. Spica ex tribus composita congestis. Duae laterales breviores, media longior, androgynae omnes. Glumae ovatae; mucronatae, spadiceae, linea flava divisae. Capsulae breves, ventricosae, mucrone longiusculo, simplici.

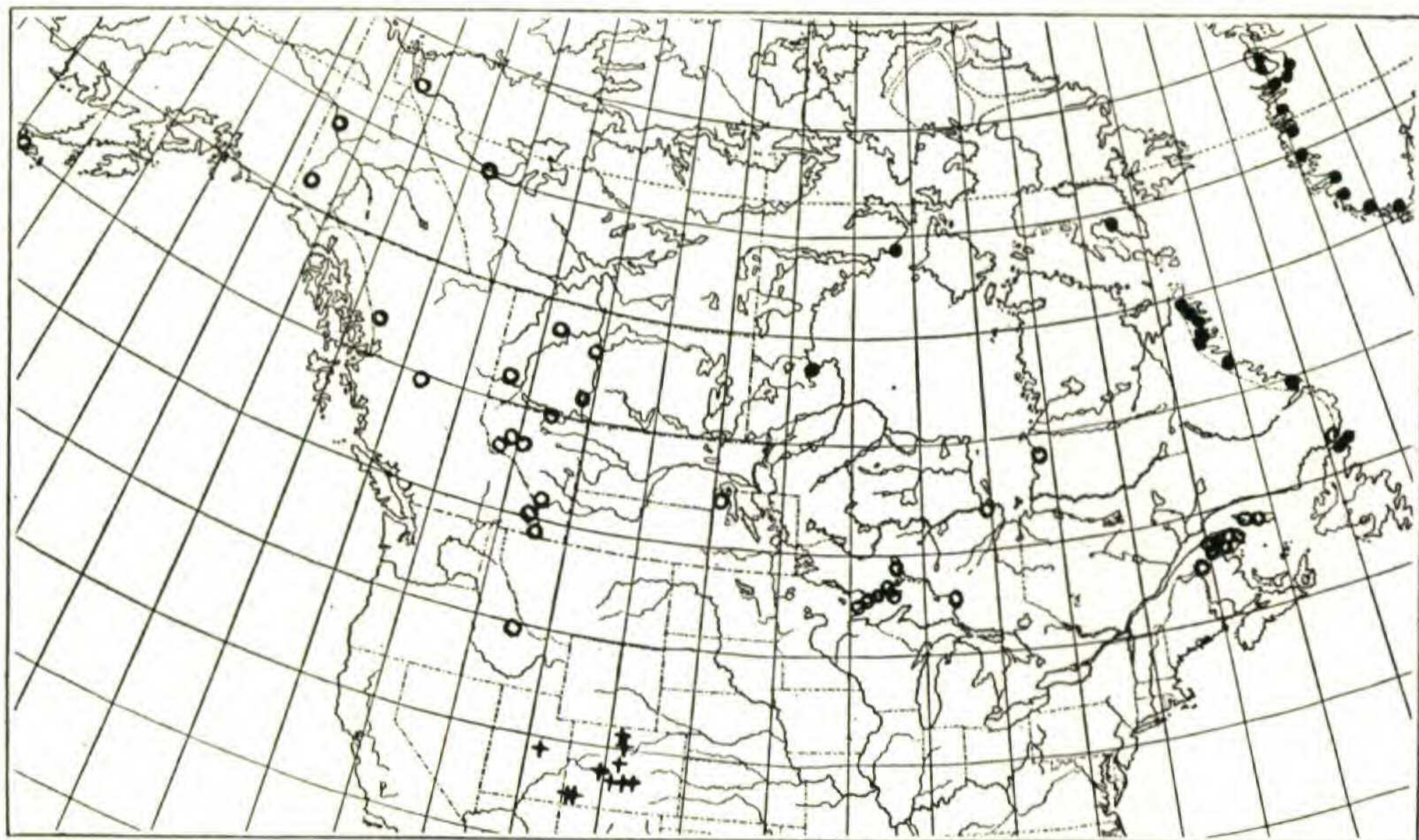
Planta SCHEUCHZERI in H. S. manifesto eadem cum 1355. Nostra magis diversa, etiam spicarum numero.¹

It will at once be noted that Haller did not accept Scheuchzer's *Cyperoides alpinum tenuifolium* as identical with his plant; therefore that can be ruled out. Haller's Swiss plant was, however, a species with culms and leaves *not scabrous* (non asper, ut neque folia), the scales of the spike with pale midrib (linea flava divisae) and the perigynia long-beaked (mucrone longiusculo). It obviously had nothing to do with *C. alpina* Swartz.

Although Haller specially pointed out that his no. 1356 was not the plant illustrated in Scheuchzer's t. 11, fig. 8, Oeder erroneously identified it with his Scandinavian specimen and Gunnerus followed Oeder. Scheuchzer's drawing was very crude, but his description extremely detailed: a loosely stoloniferous plant, the scales with a slender and pale midrib; obviously not *C. alpina* Swartz. Without attempting to identify either the plant of Haller or of Scheuchzer, problems which can best be dealt with in Europe, it is sufficient for the present study to reinstate for the circumpolar plant which has erroneously passed as *C. Halleri* the proper name, *C. alpina* Swartz.

¹ Haller, *Hist. Stirp. Indig. Helv.* ii. 184 (1768).

In North America *Carex alpina* is represented by three strongly marked geographic varieties. See PLATE 248, FIGS. 1-10 and MAP 21. Since the map was made Dr. Malte has kindly sent me the material in the Canadian National Herbarium. Dr. Malte's personal collections show *C. alpina*, var. *typica* from several additional stations on Hudson Strait and the northern coast of Hudson Bay.



Map 21. American Range of CAREX ALPINA: var. *TYPICA*, solid dots; var. *INFERALPINA*, circles; var. *STEVENII*, crosses.

C. ALPINA, var. **typica**. *C. alpina* Swartz in Liljeblad, Svensk. Fl. ed. 2: 26 (1798). *C. VahlII* Schkuhr, Riedgr. i. 87, t. Gg, fig. 94 (1801).—Cespitose; the stiff culms 0.5-3 dm. high: perigynia trigonous-obovoid, abruptly short-beaked, 2-2.5 mm. long, becoming reddish or purplish in maturity, strongly granular-papillose, the tips not recurving.—Greenland and Baffin Island south to Straits of Belle Isle, Newfoundland; alpine regions of the Shickshock Mts., Quebec; and Hudson Bay, Manitoba. The following, not including many Greenland specimens, belong here. **BAFFIN ISLAND**: Frobisher Bay, *C. S. Sewall*, no. 238 (in part). **LABRADOR**: on granitic rock, Ryan's Bay, *Woodworth*, nos. 102, 103; Okak, *Samuel Weitz*; Anatolak, *Sewall*, nos. 401, 403, 409; fresh marsh, upland terrace, Indian Harbor, *Bishop*, no. 151. **NEWFOUNDLAND**: turfey slopes of slaty hills, Little Quirpon, *Fernald & Long*, no. 27,697; turfey hillsides and barrens, western side of Quirpon Island, *Wiegand, Gilbert & Hotchkiss*, no. 27,698; dry sterile meadow, head of Mauve Bay, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, no. 27,701; turfey shore, Cape Onion, *Fernald*, no. 27,700; dry crests of trap cliffs, Anse aux Sauvages,